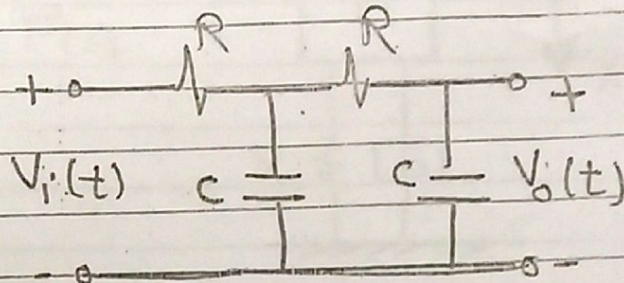


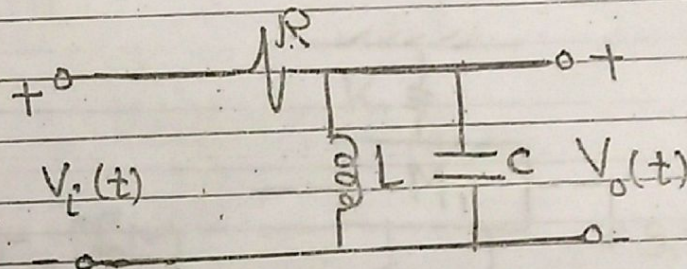
## Sheet (1)

1] Find the T.F of the following electrical systems.

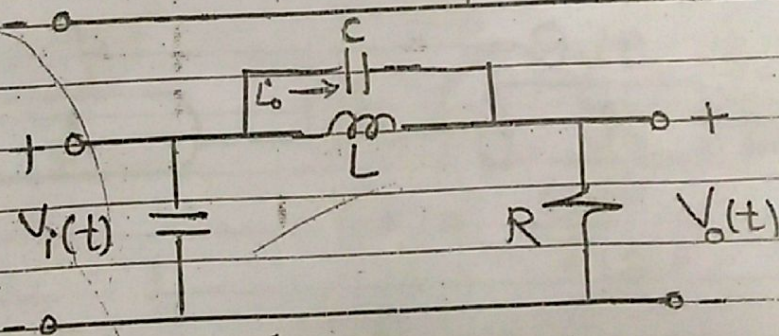
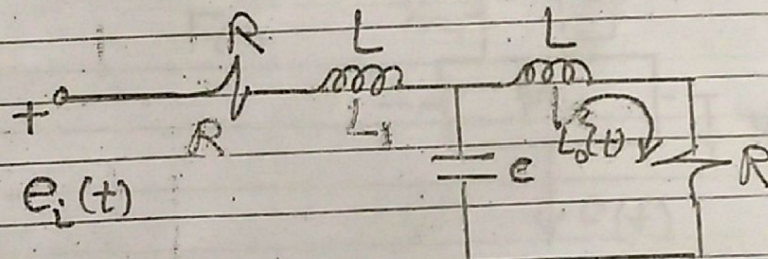
(a)



(b)



(c)

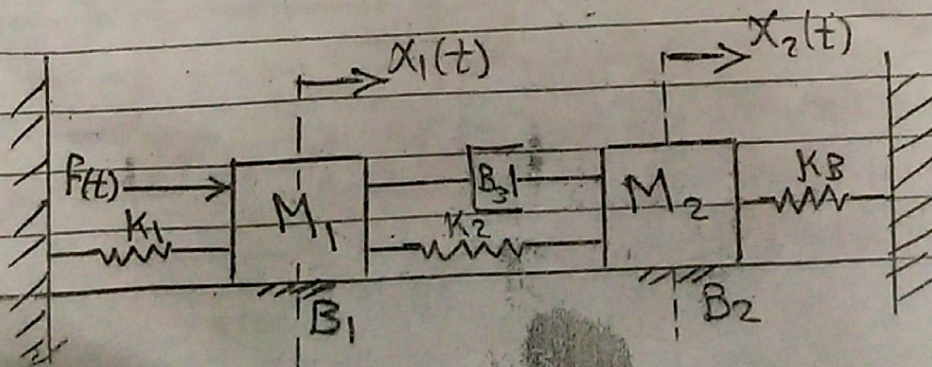


Find ① T.F =  $\frac{V_o(s)}{V_i(s)}$

② T.F =  $\frac{I_o(s)}{V_i(s)}$

2] Find the T.F of the following Mechanical systems.

(a)

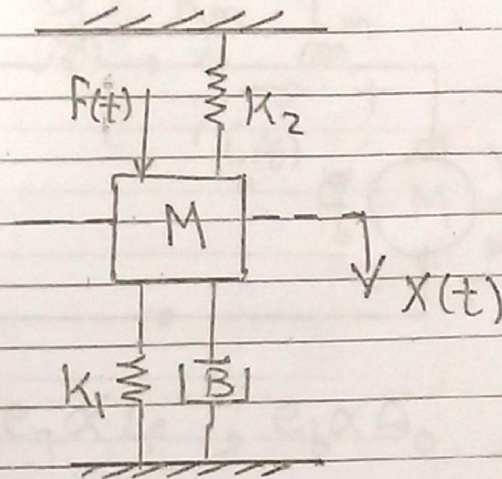


T.F =  $\frac{X_2(s)}{F(s)}$



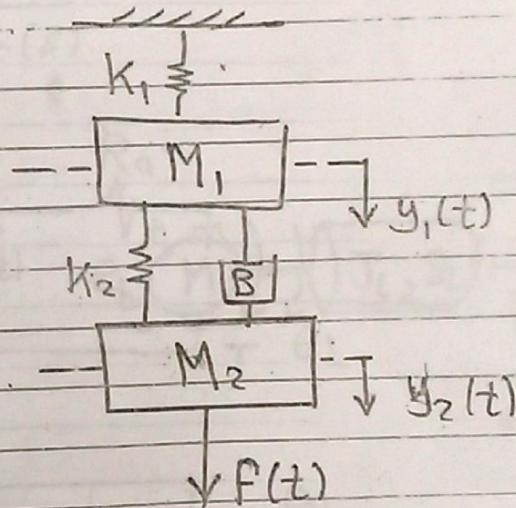
(b)

$$T.F = \frac{X(s)}{F(s)}$$

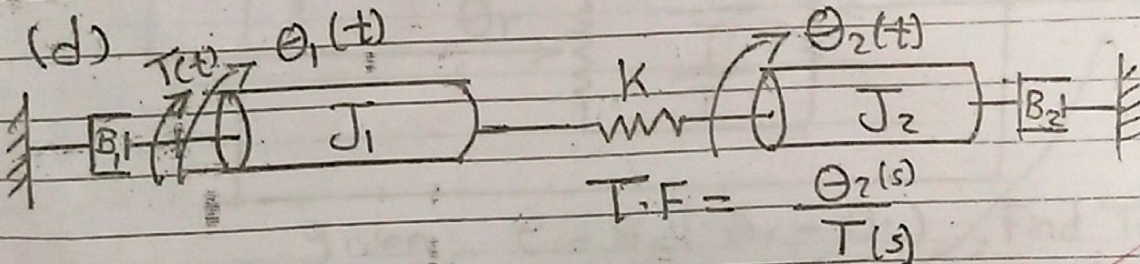


(c)

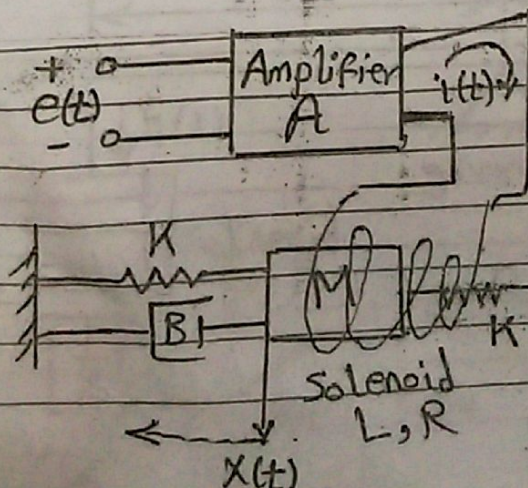
$$T.F = \frac{X_2(s)}{F(s)}$$



(d)

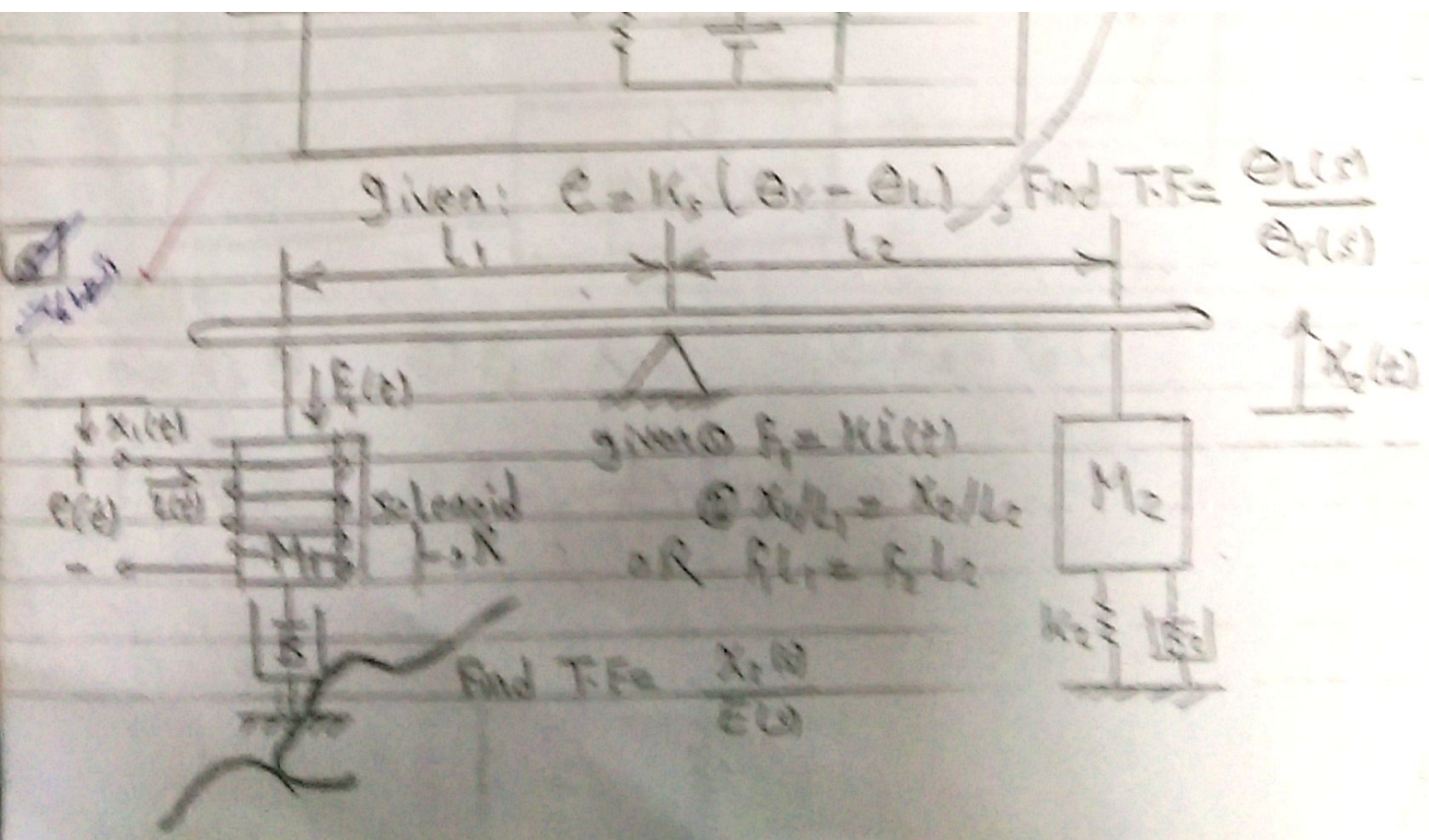


~~3~~  
4W

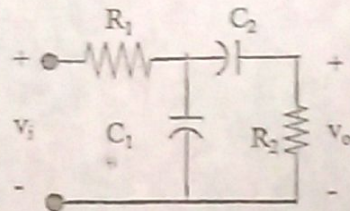


The solenoid produce a magnetic Force  $F_c(t) = K_c I(t)$   
Find  $T.F = \frac{X(s)}{E(s)}$







Course Title: Control Engineering  
Date: April 2016Course Code: CCE2251  
Allowed time: 1 hrYear: 2<sup>nd</sup>[a] Find the transfer function for the following circuit  $V_o(s)/V_i(s)$  (6 Marks)

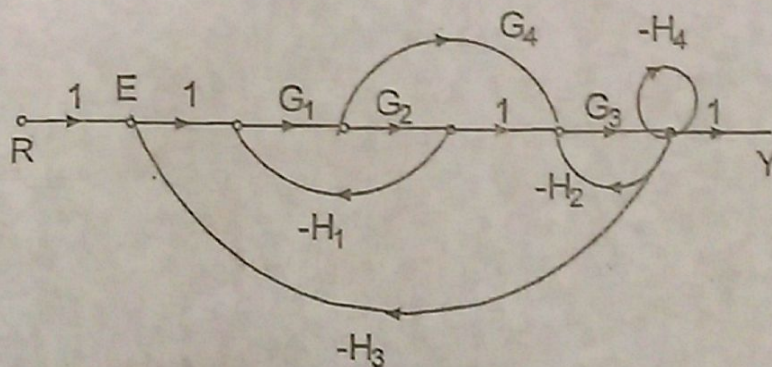
[b] The characteristic equations of linear control systems are given below. Apply Routh-Hurwitz criterion to determine the root distribution and the system stability. (7 Marks)

1)  $s^5 + 8s^4 + 2s^3 + 4s^2 + 2s + 4 = 0$

2)  $s^6 + s^5 + 2s^4 + s^3 + 3s^2 + 2s + 2 = 0$

3)  $S^5 + 2S^4 + 2S^2 + 3S + 7 = 0$

[c] Using signal flow graph, find the transfer function of the system

 $Y(s)/R(s)$  (5 Marks) and  $E(s)/R(s)$ . (2 Marks)